Index

State of South Carolina Administrative Record
TMDL Submittal for Sanders Branch/Coosawhatchie River

Exhibit B
Basis for 303(d) Listing
Sanders Branch/Coosawhatchie River

Water Quality Standards Being Violated: Dissolved Oxygen

Pollutants of Concern: Biochemical Oxygen Demand (Carbonaceous and Nitrogenous)

Water Classification: Freshwaters

Sanders Branch and the Coosawhatchie River are classified Class Freshwaters with Sanders Branch having site specific criteria for dissolved oxygen and pH. Waters of this class are to be:

> "Freshwaters suitable for primary and secondary contact recreation and as a source for drinking water supply after conventional treatment in accordance with the requirements of the Department. Suitable for fishing and the survival and propagation of a balanced indigenous aquatic community of fauna and flora. Suitable also for industrial and agricultural uses."

Dissolved Oxygen Criteria:

Coosawhatchie River:	Daily average of 5 mg/l, with a minimum of 4 mg/l
Sanders Branch:	A minimum of 4 mg/l

DHEC had data from three secondary ambient monitoring stations on Sanders Branch and one primary station on the Coosawhatchie River downstream of its confluence with Sanders Branch: CSTL-108 on Sanders Branch downstream of the International Paper discharge; CSTL-010 on Sanders Branch downstream of CSTL-108 and upstream of Hampton's discharge; CSTL-011 on Sanders Branch downstream of Hampton's discharge; and CSTL-109 on the Coosawhatchie River downstream of Sanders Branch. The two downstream stations (CSTL-011 and CSTL-109) show aquatic life uses not fully supporting due to dissolved oxygen excursions. All 4 stations show conditions not fully supporting recreational uses due to fecal coliform bacteria; however, this TMDL will not address this parameter. The current standard of 200 per 100 ml was adopted in 1992, at which time the lengthy process of issuing more stringent discharge permits and requiring treatment plant upgrades was begun. It is expected that the recently completed plant upgrades will result in meeting the current fecal coliform standards. For this reason, only impairment resulting from dissolved oxygen criteria violations will be addressed in this TMDL.

Exhibit C

TMDL Technical Basis

Permitted Dischargers In Area of Concern

Permit #	Facility	Receiving Water	Type	Flow(mgd)
SC0001830	International Paper	Sanders Branch	Ind	1.5
SC0021318	Hampton	Sanders Branch	Mun	2.0
SC0042242	Safety Disposal	Sanders Branch Trib	Ind	MR

International Paper's Hampton Plant discharges an average 1.5 mgd of process and recirculated non-contact cooling water to the headwaters of Sanders Branch approximately 5.6 miles upstream of the confluence of Sanders Branch and the Coosawhatchie River. The Town of Hampton is permitted to discharge 2 mgd of domestic wastewater to Sanders Branch approximately 2.6 miles upstream of the Coosawhatchie River. Safety Disposal Systems of SC is permitted for an intermittent discharge of stormwater to an un-named tributary of Sanders Branch.

Modeling Effort

The QUAL2E model was used to simulate Sanders Branch from the International Paper discharge 5.6 miles to the Coosawhatchie River and the Coosawhatchie River for a distance of 4.9 miles below Sanders Branch. The model includes the International Paper and Hampton discharges. The Safety Disposal discharge was not included since it is an intermittent stormwater discharge and is not expected to contribute loading to the stream under the designated critical conditions. Also, to minimize impact of the discharge under high flow conditions, the permit includes limits of: BOD_5, 15 mg/l; effluent DO, 5 mg/l; and, fecal coliform, 200 per 100 ml. The model was not calibrated to field conditions. Existing ambient monitoring data, U.S. Geological Survey (USGS) flow and topography information and the State/EPA Agreement on development of wasteload allocations were used to develop model inputs. A hard copy of the model output as well as electronic copies of the input and output files are attached. Also attached are copies of the Wasteload Allocation Worksheet and Coordination Forms for the two modeled discharges. These include documentation of model inputs.

Critical Conditions

Flow, dissolved oxygen (DO), five day biochemical oxygen demand (BOD) and temperature data were reviewed to determine if low flow, summer conditions were appropriate conditions for development of the total maximum daily load (TMDL). Data available at STORET station CSTL-109 were reviewed to determine the relationship between flow and DO, water temperature and DO and between flow and BOD. It was determined there was a relatively strong correlation between DO and temperature, as would be expected, with lower DOs experienced during periods of high water temperature. There appeared, however, to be very little correlation between flow and DO or flow and BOD. Low DO concentrations were experienced at high and low flows as were high DO concentrations. BOD concentrations were low (average of 2 mg/l, max of 5 mg/l when flow measurements available) regardless of flow, which ranged from 0 cfs to over 3,000 cfs. Temperature appeared to be the main determining factor.

Review of the Savannah/Salkahatchie watershed document shows the Coosawhatchie River to be a black water system. Such streams are generally associated with wide flood plains that experience swamp-like conditions. Land use in the watershed is: 39 % forest; 28% forested wetlands; 10 % shrub/scrub land; 3 % non-forested wetlands; 14% agricultural land; and, 6% urban land. Based on land use in the watershed, low dissolved oxygen concentrations found under high flow conditions are considered to be natural rather than attributable to an identifiable, correctable, non-point source of pollution.

Based on the above information, high temperature conditions when the minimum volume of water is available for dilution/assimilation will be considered appropriate critical conditions for development of the Sanders Branch/Coosawhatchie River TMDL. A summer temperature of 27^{o} C was utilized in the model as was a headwater flow of 0.0 cfs, the estimated 7Q10 of both Sanders Branch and the Coosawhatchie River.

Seasonality

Seasonality is considered for the Sanders Branch TMDL through the use of conservative summer conditions for modeling. Seasonality is considered for the Hampton WWTF by allowing a less restrictive winter NH_3-N limit of 2 mg/l. Seasonal limits were not considered appropriate for the International Paper discharge.

Margin of Safety

An implied margin of safety was incorporated into the modeling effort through the use of conservative assumptions including a critical summer temperature of 27^{o} C, corresponding conservative decay rates as outlined in the State/EPA agreement on wasteload allocations , and use of a 7Q10 flow of 0.0 cfs.

Total Maximum Daily Load
Sanders Branch/Coosawhatchie River

Summer TMDL (May-October)

	BOD_5 (lbs/day)	NH_3-N (lbs/day)
Load Allocation	*	*
Wasteload Allocation	241.9	23.0
TMDL	241.9	23.0

Winter TMDL (November-February)

	BOD_5 (lbs/day)	NH_3-N (lbs/day)
Load Allocation	*	*
Wasteload Allocation	241.9	39.7
TMDL	241.9	39.7

* The Load Allocation is considered zero since the critical conditions is defined as a 7Q10 of zero when there would be no non-point source contribution to the stream.

TMDL Determination:

The QUAL2E model described in Exhibit C serves as the technical basis for the above TMDL; however, the TMDL is based on limits for the Town of Hampton which are slightly less restrictive that those indicated by the model. During the 1992 basin review, limits similar to those determined by the current QUAL2E model (BOD_5, 7 mg/l; NH_3-N, 0.5 mg/l summer, and effluent DO, 6 mg/l) were recommended to the Domestic Wastewater Permitting Section. Because the QUAL2E model was not a calibrated model and based on the State/EPA Agreement, limits more restrictive than limits of technology (BOD_5, 10 mg/l; NH_3-N, 1 mg/l summer, 2 mg/l winter; and, effluent DO, 6 mg/l) are not appropriate for a municipal waste water treatment facility. A permit was issued with these limits and the upgraded plant went on line in the fall of 1996. The TMDL will be considered to include the Town of Hampton's discharge at their current permit limits.

The modeled limits for the International Paper discharge (BOD_5, 6 mg/l, NH_3-N, 0.5 mg/l, effluent DO, 6 mg/l) were accepted by the applicant; placed on public notice with notification the WLA would be part of a TMDL; approved by EPA; and, incorporated into a permit issued September 29, 1997. This loading is incorporated into the above TMDL.

Calculations for Point Source Contributions

International Paper Limits:

Flow :	1.5 mgd
BOD_5 :	6 mg/l
NH_3-N:	0.5 mg/l

Loading:

BOD_5 :	1.5 mgd x 8.34 x 6 mg/l	=	75.1 lbs /day
NH_3-N:	2 mgd x 8.34 x 0.5 mg/s	=	6.3 lbs/day

Hampton Limits:

Flow :	2 mgd
BOD_5 :	10 mg/l
NH_3-N:	1 mg/l (summer)
NH_3-N:	2 mg/l (winter)

Loading:

BOD_5 :	2 mgd x 8.34 x 10 mg/l	=	166.8 lbs/day
NH_3-N:	2 mgd x 8.34 x 1.0 mg/s	=	16.7 lbs/day (summer)
NH_3-N:	2 mgd x 8.34 x 2.0 mg/s	=	33.4 lbs/day (winter)

Total Loading:

BOD

International Paper:	75.1 lbs/day
Hampton	166.8 lbs/day
	241.9 lbs/day

NH3-N (summer)

International Paper:	6.3 lbs/day
Hampton	16.7 lbs/day
	23.0 lbs/day

NH3-N (winter)

International Paper:	6.3 lbs/day
Hampton	33.4 lbs/day
	39.7 lbs/day

S.C. DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL
BUREAU OF WATER POLLUTION CONTROL
DIVISION OF WATER QUALITY AND SHELLFISH SANITATION
WASTELOAD ALLOCATION SECTION

WASTELOAD ALLOCATION WORKSHEET AND COORDINATION FORM

Date 01-20-98 Engineer Hu WLA# 2065

Discharger Name Town of Hampton

NPDES SC00 21318 County Hampton W.Shed.MU 0104
W.Shed U 03050208 070

Receiving Waters Sanders Branch

I. Wasteload Allocation Section

A. Mathematical Model Data:

Model Used Qual2E Name sanders.new

Stream 7Q10 0.0 cfs Average Annual Flow 10.12 cfs

USGS Station 02176500 Site --- Drainage Area: 11 mi^2

Stream Q:Waste Q Ratio ---- :1 Temp 27.0 °C 80.6 °F

Velocity 0.13-0.52 ft/s Slope ft/mi

K1 0.3 K2 1.0-10.0 K3 0.3-0.5

F Ratio 1.5 :1 Unit 7Q10 0.0

Stream Characteristics: Sanders Br Class FW w/min 4 DO trib to Coosawhatchie Class FW with avg 5 & min 4 DO

B. Model Input Sources:

Waters in Question: Yes - No

Similar Waters: n/a

Field Data Available: None Fair Good Excellent

Describe Above: USGS 1765; USGS Topo's; STORET CSTL 121; CSTL 010; 011; & 109

Literature: Strategy

C. Model Validity: (Circle appropriate response)

Intensive Survey: **YES** - NO
Calibrated: Yes - **NO**
Verified: Yes - **NO**

Analyst's Assessment of Simulation:

Poor **FAIR** Good Excellent

Comments: Intensive Survey 1978; TOT, 1981; USGS 1765

D. Model Outputs:

BOD5 7 mg/l NH3-N Summer 0.5 mg/l
Winter 0.5 mg/l

Effluent DO 6.0 mg/l 2.0 mgd
Flow

Predicted DO >5 mg/l 3.1 cfs

Total Residual Chlorine (mg/l) Avg 0.011 Max 0.019

Fecal Coliform (/100 ml) Avg 200 Max 400

Other parameters:

E. Have studies been conducted or is information available which would have an influence on the level of wastewater treatment needed? (Yes) - No. If yes, attach comments. See B & C Above

F. Stream Classification: B w/4.0 If class is saltwater, provide documentation of shellfish harvesting classification, buffer zone status and rationale for issuance of WLA.

G. Could the discharge be considered a wetland discharge? Yes - (No) If yes, attach comments from WQ Certification and Wetland Programs Section as needed.

H. Will the proposed discharge and recommended limits protect the existing uses of the waterbody? (Yes) - No. If no, attach a detailed explanation.

I. Is there evidence that the practical use of the stream is different from its classified use and may warrant alternate consideration? Yes - (No.) If yes, attach comments.

J. Is there reason to believe that questionable benefits will result from requiring model recommendations? Yes - (No.) If yes, attach comments.

K. Wasteload Allocation Section recommendations:

BOD5 10.0 mg/l NH3-N Summer 1.0 mg/l Winter 2.0 mg/l

D.O. 6.0 mg/l Flow 2.0 mgd

Total Residual Chlorine (mg/l) Avg 0.011 Max 0.019

Fecal Coliform (/100 ml) Avg 200 Max 400

Other Parameters: _____

L. Do the recommendations in K above agree with the model output in D above? Yes - **NO** If no, attach comments or explain below.
See attached memorandum. Sanders Branch and Coosawhatchie River are on the 303d list of impaired waters due to DO

Analyst: Larry Turner Date: Jan 21, 1998

Reviewer: Larry Turner Date: 1-21-98

II. ENGINEERING DIVISION

A. Does the Wasteload allocation and Certification Section recommendation exceed established technological limits for this type of wastewater? Yes - (No) If yes, recommend limits in II.E. and make comments in the space provided.

B. Are there factors which make the Wasteload Allocation Sections recommendation inconsistent with best engineering judgement and/or Federal effluent guidelines? Yes - (No) If yes, recommend limits in II.E. and make comments in the space provided.

C. Are there other factors which would make the WLA either more stringent or less stringent? Yes - (No) If yes, recommend limits in II.E. and make comments in the space provided.

D. Are there factors which make the Wasteload Allocation Section's recommendation impractical or unimplementable at this time? Yes - (No) If yes, recommend limits in II.E. and make comments in the space provided.

E. Recommended limits in lieu of those made by the Wasteload Allocation Section:

BOD5 10.0 mg/l NH3-N Summer 1.0 mg/l Winter 2.0 mg/l

D.O. 6.0 mg/l Flow 2.0 mgd

Total Residual Chlorine (mg/l) Avg <0.1 Max <0.1

Fecal Coliform (/100 ml) Avg 200 Max 400

Other parameters: _____

Engineering Comments: _____

F. Is there agreement with the Wasteload Allocation Section's recommendations?

Yes - No

Engineer: _____

Date: 2-2-98

III. Wasteload Allocation Section

Is full agreement concluded? Yes - No

If yes, the wasteload allocation is:

BOD5 10.0 mg/l NH3-N Summer 1.0 mg/l Winter 2.0 mg/l

D.O. 6.0 mg/l Flow 2.0 mgd

Total Residual Chlorine (mg/l) Avg <0.1 Max <0.1

Fecal Coliform (/100 ml) Avg 200 Max 400

Other Parameters: _____

Comments: _____

In that there is no agreement, see the wasteload allocation procedures for further steps.

Approval: Larry Turner Date: 2-2-98

D H E C

PROMOTE PROTECT PROSPER

South Carolina Department of Health
and Environmental Control

MEMORANDUM

TO: Mike Montebello, Manager
Domestic Wastewater Permitting Section

FROM: Larry Turner, Manager
Water Quality Modeling Section

SUBJECT: Town of Hampton, SC0021318, Hampton County

DATE: January 21, 1998

This memorandum serves as additional information for the attached Wasteload Allocation Worksheet and Allocation Form. The Town of Hampton currently is permitted to discharge 2 mgd of wastewater treated to limits of: BOD_5, 10 mg/l; NH_3 - N, summer 1 mg/l winter 2 mg/l; and, a minimum effluent DO of 6 mg/l. Though a schedule of compliance required these final limits to be met in the fall of 1996 and a plant upgrade was completed, the plant appears to have only recently begun to consistently meet these limits.

The Hampton plant discharges to Sanders Branch which then flows approximately 2.6 miles to the Coosawhatchie River. The 7Q10 for both Sanders Branch and the Coosawhatchie River is considered 0.0 cfs. DHEC has five ambient monitoring stations in the area: CSTL-121 on the Coosawhatchie River upstream of Sanders Branch; CSTL-109 on the Coosawhatchie River below Sanders Branch; CSTL-108 on Sanders Branch downstream of the International Paper discharge; CSTL-010 on Sanders Branch downstream of CSTL-108 and upstream of Hampton's discharge; and, CSTL-011 on Sanders Branch downstream of the Hampton discharge. Station CSTL-121 is a watershed station active only for one year out of 5. Station CSTL-109 is a primary station while the three stations on Sanders Branch are secondary stations.

Sanders Branch is classified FW with a site specific dissolved oxygen criteria of a minimum of 4 mg/l. The Coosawhatchie River is classified FW with the standard dissolved oxygen criteria of a daily average of 5 mg/l with a minimum of 4 mg/l. Stations CSTL-011 and CSTL-109 do not meet applicable criteria for dissolved oxygen which has resulted in both Sanders Branch and the Coosawhatchie River being placed on the 303(d) list of impaired

waters.

There have been extensive efforts over the last ten years to improve the quality of effluent discharged to Sanders Branch. Negotiations with International Paper/Hampton Plant (formerly Westinghouse/Hampton Plant) have resulted in limits of BOD_5, 6 mg/l; NH_3-N, 0.5 mg/l and a minimum effluent DO of 6 mg/l. These limits are considered by the Department as limits of technology for this industry. In November of 1990, The Water Quality Modeling Section recommended limits of BOD_5, 6 mg/l; NH_3-N, 1 mg/l summer and 2 mg/l winter; and, a minimum effluent DO of 6 mg/l for the Hampton expansion to 2 mgd. The BOD_5 limit was finalized at 10 mg/l based on the recommendation of the permitting engineer.

Results of the current modeling review are consistent with past work that indicate limits for Hampton need to approach re-use levels for Sanders Branch and the Coosawhatchie River to meet ambient dissolved oxygen criteria; however, results are based on an uncalibrated model. Further, recent macro invertebrate work done by the applicant indicate similar communities above and below the discharge. Note that this work did not say the stream was healthy, just that the communities above and below the outfall were similar. We are reluctant to recommend such limits for a domestic treatment plant based on an uncalibrated model. This is especially true since the upgrade to 2 mgd and the current limits of 10-1-6 has only recently been completed. It would appear prudent to allow the plant to operate at current limits for the next full permitting cycle, review available ambient data and studies to be required of the permittee as a permit condition, and only then determine if more restrictive limits will be required. Jim Greenfield and Dave Hill of EPA Region IV have indicated this approach would be acceptable.

The TMDL for this water body will have to be completed and submitted to EPA for preliminary approval along with the draft permit. The public notice for the permit will be worded such that it will also serve as public notice of the TMDL. The TMDL will then be formally approved by EPA. I will forward the draft TMDL package for inclusion with the draft permit to be sent to EPA by January 30. If you have any questions concerning this matter, please see me.

S.C. DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL
BUREAU OF WATER POLLUTION CONTROL
DIVISION OF WATER QUALITY AND SHELLFISH SANITATION
WASTELOAD ALLOCATION SECTION

WASTELOAD ALLOCATION WORKSHEET AND COORDINATION FORM

Date 06-18-97 Engineer Tim Harley WLA# 2070

Discharger Name International Paper/Hampton

NPDES SC00 01830 County Hampton W.Shed.MU 0104
W.Shed U 03050208 070

Receiving Waters Sanders Branch

I. Wasteload Allocation Section

A. Mathematical Model Data:

Model Used Qual2E Name sanders.new

Stream 7Q10 0.0 cfs Average Annual Flow 10.12 cfs

USGS Station 02176500 Site --- Drainage Area: 11 mi^2

Stream Q:Waste Q Ratio ---- :1 Temp 27.0 °C 80.6 °F

Velocity 0.13-0.52 ft/s Slope ft/mi

K1 0.3 K2 1.0-10.0 K3 0.3-0.5

F Ratio ~~1.5~~ 3 :1 Unit 7Q10 0.0

Stream Characteristics: Sanders Br class B w/min 4 DO
trib to Coosawhatchie Class a with avg 5 & min 4 DO

B. Model Input Sources:

Waters in Question: Yes - No

Similar Waters: n/a

Field Data Available: None Fair Good Excellent

Describe Above: USGS 1765; USGS Topo's; STORET CSTL 121;
CSTL 010; 011; & 109

Literature: Strategy

C. Model Validity: (Circle appropriate response)

Intensive Survey: **YES** - NO
Calibrated: Yes - NO
Verified: Yes - NO

Analyst's Assessment of Simulation:

Poor **FAIR** Good Excellent

Comments: Intensive Survey 1978; TOT, 1981; USGS 1765

D. Model Outputs:

BOD5 6 mg/l NH3-N Summer 0.5 mg/l
Winter 0.5 mg/l

Effluent DO 6.0 mg/l Flow 1.5 mgd

Predicted DO >5 mg/l 2.33 cfs

Total Residual Chlorine (mg/l) Avg 0.11 Max 0.19

Fecal Coliform (/100 ml) Avg 200 Max 400

Other parameters: _____

E. Have studies been conducted or is information available which would have an influence on the level of wastewater treatment needed? (Yes) - No. If yes, attach comments. See above.

F. Stream Classification: B w/4.0 If class is saltwater, provide documentation of shellfish harvesting classification, buffer zone status and rationale for issuance of WLA.

G. Could the discharge be considered a wetland discharge? Yes - (No) If yes, attach comments from WQ Certification and Wetland Programs Section as needed.

H. Will the proposed discharge and recommended limits protect the existing uses of the waterbody? (Yes) - No. If no, attach a detailed explanation.

I. Is there evidence that the practical use of the stream is different from its classified use and may warrant alternate consideration? Yes - (No) If yes, attach comments.

J. Is there reason to believe that questionable benefits will result from requiring model recommendations? Yes - (No) If yes, attach comments.

K. Wasteload Allocation Section recommendations:

BOD5 6.0 mg/l NH3-N Summer 0.5 mg/l

Winter 0.5 mg/l

D.O. 6.0 mg/l Flow 2.0 mgd

Total Residual Chlorine (mg/l) Avg 0.11 Max 0.19

Fecal Coliform (/100 ml) Avg 200 Max 400

Other Parameters: _____

L. Do the recommendations in K above agree with the model output in D above? YES - No If no, attach comments or explain below.

Sanders Branch and Coosawhatchie River are on the 303d list of impaired waters due to DO

Analyst: Larry Turner Date: June 18, 1997

Reviewer: Larry Turner Date: 6-19-97

II. ENGINEERING DIVISION

A. Does the Wasteload allocation and Certification Section recommendation exceed established technological limits for this type of wastewater? Yes - (No) If yes, recommend limits in II.E. and make comments in the space provided.

B. Are there factors which make the Wasteload Allocation Sections recommendation inconsistent with best engineering judgement and/or Federal effluent guidelines? Yes - (No) If yes, recommend limits in II.E. and make comments in the space provided.

C. Are there other factors which would make the WLA either more stringent or less stringent? Yes - (No) If yes, recommend limits in II.E. and make comments in the space provided.

D. Are there factors which make the Wasteload Allocation Section's recommendation impractical or unimplementable at this time? Yes - (No) If yes, recommend limits in II.E. and make comments in the space provided.

E. Recommended limits in lieu of those made by the Wasteload Allocation Section:

BOD5 _____ mg/l NH3-N Summer _____ mg/l

Winter _____ mg/l

D.O. _____ mg/l Flow _____ mgd

Total Residual Chlorine (mg/l) Avg —— Max ——

Fecal Coliform (/100 ml) Avg —— Max ——

Other parameters: _____

Engineering Comments: No sanitary

F. Is there agreement with the Wasteload Allocation Section's recommendations?

(Yes) - No

Engineer: Gary Mullinax for Tim Harley

Date: 8-12-97

III. Wasteload Allocation Section

Is full agreement concluded? (Yes) - No

If yes, the wasteload allocation is:

BOD5 6.0 mg/l NH3-N Summer 0.5 mg/l

Winter 0.5 mg/l

D.O. 6.0 mg/l Flow ~~2.0~~ 1.5 mgd

Total Residual Chlorine (mg/l) Avg —— Max ——

Fecal Coliform (/100 ml) Avg —— Max ——

Other Parameters: _____

Comments: _____

In that there is no agreement, see the wasteload allocation procedures for further steps.

Approval: Larry Turner Date: 8-12-97

Exhibit E
Public Participation
Sanders Branch/Coosawhatchie River TMDL

This TMDL is being submitted for technical approval prior to being placed on public notice. This is so that it can be considered with the jointly submitted draft NPDES permit for the Town of Hampton. Upon technical approval of the TMDL and draft permit, both will be placed on public notice via the normal NPDES public notice process. This includes posting of the notice in prominent places adjacent to the stream and in at least three public places in the Town of Hampton, or surrounding area. Further, the notice will be published in appropriate local and statewide newspapers and will be mailed to individuals on the NPDES public notice mailing list.

Upon close of the public comment period, comments will reviewed and a responsiveness summary developed. Documentation of the public notice, comments received and the responsiveness summary will then be submitted to EPA Region IV for final approval of the TMDL.